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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/585,843	06/09/2008	Frederic Crayssac	Serie 6151	7879
40582	7590	06/11/2009		
AIR LIQUIDE Intellectual Property 2700 POST OAK BOULEVARD, SUITE 1800 HOUSTON, TX 77056			EXAMINER FLANIGAN, ALLEN J	
			ART UNIT 3744	PAPER NUMBER
			MAIL DATE 06/11/2009	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/585,843

Applicant(s)

CRAYSSAC ET AL.

Examiner

Allen J. Flanigan

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/55/08)
Paper No(s)/Mail Date 7/06, 8/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Imamura et al.

See Fig. 2 of Imamura et al. Although there is no suggestion in Imamura et al. to employ the corrugated sintered sheet disclosed therein as a fin in a heat exchanger, the claims are limited to a corrugated element per se. The recitation that the claimed element is a “fin for plate and fin heat exchanger” is a recitation concerning the intended use of the claimed corrugated structure; at best such recitations require the prior art article be useable in this manner, which Imamura et al.’s sheet clearly is. See *In re Schreiber*, 44 U.S.P.Q.2d 1429.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kutscher et al.

Kutscher et al. teach corrugated fins that are highly porous and may be sintered (see lines 41-47 of column 13 of Kutscher et al.) Kutscher et al. also teach that fin thickness and pore diameter are recognized to be result-effective variables (see bridging paragraph of columns 9-10), and it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to select optimum thicknesses and pore diameters for the sintered corrugated fins of Kutscher et al. depending on the application contemplated. See MPEP 2144.05 II.

Claims 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. in view of Schwarz et al. and Kutscher et al.

Wagner et al. teach the three zone evaporator/condenser claimed in claim 16. According to the Derwent abstract, variants of the design can have a coating of metal foam in one or more zones to enhance heat transfer. Providing such high porosity for enhanced boiling/heat transfer by means of separate sintered layers provided in place of plain corrugated fins is taught by Schwarz et al. (see lines 20-30 of column 5, lines 25-35 of column 6 of Schwarz et al.). Finally, it is known in the art that fins of corrugated shape can be formed of a sintered material to provide high porosity as taught in Kutscher et al. (see above citation in the rejection of claims 14 and 15). Thus, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to employ such highly porous corrugated sintered sheets in one or more zones of Wagner et al. to enhance heat transfer.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wagner et al. in view of Schwarz et al. and Kutscher et al. as applied to claim 19 above, and further in view of Bruder et al.

It is known in the art to provide air separation by means of two columns (such as low pressure and medium pressure columns) that are thermally coupled by an additional exchanger as taught in Bruder et al., and it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to provide dual columns of the type disclosed in Wagner et al. modified as above in view of the prior art, for air separation purposes as taught in Bruder.

Applicants are reminded of the duty to disclose information that is material to patentability as defined in 37 C.F.R. 1.56. As set forth in the rule, this duty extends to:

- Each inventor named in the application;
- Each attorney or agent who prepares or prosecutes the application; and
- Every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application.

Materiality for the purposes of this rule involves information which is not cumulative to information already of record and, inter alia, "establishes, by

itself or in combination with other information, a *prima facie* case of unpatentability of a claim”.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The remaining references of record concern heat exchanger designs employing porous or sintered fins or surfaces.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen J. Flanigan whose telephone number is (571) 272-4910. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on (571) 272-4834. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Allen J. Flanigan/
Primary Examiner, Art Unit 3744